

UNITED STATES GOVERNMENT

# Memorandum

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SUBJECT: Review/Redesign of the Thailand Seed Development Project

As a result of Seed Development Project problems pointed up in previous evaluations, one in July 1977 and one in October 1978, as well as a 1979 Project audit, a review/redesign was carried out for USAID/Thailand in March 1980 by Dr. James C. Delouche, Director of the Seed Technology Laboratory, Mississippi State University and A. David Lundberg, ASIA/TR/ARD. Substantial Project progress has been made since the October 1978 evaluation, particularly in the areas of private sector and other donor involvement.

The attached report discusses this progress, existing problems, as well as recommendations and needed project design changes. The report has five sections: (1) an overview of project progress, (2) a discussion of major problems, (3) a discussion of major redesign changes, (4) a list of recommendations and (5) a more in-depth discussion of project components and problems. If time is a constraint, you should focus your attention on Sections 1 through 4, pages 3 through 12 of the report.

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**Review/Redesign  
of the  
Thailand Seed Development Project**

**March 1980**

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## I. Over-View of Progress of the Seed Development Project

The Seed Development Project has been faulted in both project evaluations, one in July 1977 and one in September-October 1978 as well as a July 1979 project audit for failure to develop in accord with the implementation schedule and some descriptive specifications in the original Project Paper (PP). Much of the delay in implementation has its origins in the bureaucracy in the RTG and AID.

The Seed Development Project was the first loan project in Thailand requiring host country procurement of technical assistance and equipment. There were no precedents. Technical assistance contract negotiations were prolonged and exasperating. Equipment procurement and construction contracts were delayed, some as much as two years. Much has been learned in the RTG and USAID at the expense of the Seed Development Project.

The evaluations and audit of the Project judge progress against projections in the PP. The various components described in the PP were and remain valid and the Project has followed these descriptive segments in essentially all the major details, save for the role of the Marketing Organization for Farmers (MOF), marketing of seed, and implementation timing. The PP took an optimistic view. It did not expect that all the delays that could happen would happen. There were delays and progress was disappointingly slow judged against the optimistic projections in the PP, especially at the time of the September 1978 evaluation.

Judged against the status of the seed program/industry in Thailand at the start of the Project, and against seed projects funded by AID, World Bank, UNDP and FAO in a host of other countries, progress in developing a seed program/industry in Thailand has been exceptional.

- (1) Some 3,000 MT of seed of six crops are being produced in FY 80. 173 tons were produced at the start of the Project in FY 76.
- (2) Farmers have confidence in the seed as evidenced by 300 MT sales in small lots (1-10 bags) at the Phitsanulok Center in 1979. Many of the farmers traveled to the Center by bus and bought seed 3 months in advance of the planting season, because they were afraid the seed supply would run out if they waited longer. All corn seed, approximately 1,000 tons, is now sold out some two months before planting begins. Demand is now far exceeding production capacity.

- (3) Some 3,500 contract farm families are organized in groups to produce seed, receiving supervision and advice, and greater income than if they were grain producers as they were before the Project in FY 75. Some 200 contract farm families were organized at that time.
- (4) A Seed Division with a dedicated staff of some 250 in the Department of Agricultural Extension (DOAE) has been established under the AID Seed Development Loan to manage RTG seed activities and promote the seed industry in Thailand. There was no Seed Division in 1977.
- (5) Four very exceptional Seed Centers have been established and are operational. Minor improvements will be needed but the Centers are in place and are operational showcases of the DOAE and AID assistance.
- (6) The Project has provided a base for assistance from other donors. The Japanese have financed a 5th seed center with a capacity of 500 tons, mainly for corn. It is also under operational control of the DOAE Seed Division. This assistance has complemented the Project. EEC is negotiating to provide a 6th seed center or a series of small Centers in the South, an area not covered by present project activities.
- (7) Private companies are emerging; two are in operation, two are constructing facilities and two more are in the advanced feasibility stage, undoubtedly as a result of the examples in the Seed Development Project. Still other private companies are looking into the feasibility of establishing seed businesses. The Seed Development Project has assisted the private companies in technical matters, training and in providing information needed to determine the feasibility of a private seed business in Thailand. No private companies were willing to enter the business at the time of Project initiation. It is projected that the private sector will be producing at least 5,000 tons of seed by FY 1982.
- (8) The Project has served well as a mechanism for supply of seed for special projects, especially during emergency situations (floods, drought, etc.) and its potential contributions in this area are enormous.

- (9) Experience has been gained, people trained, that will be reflected in improved efficiency and effectiveness in both the public and private segments of the emerging seed industry.
- (10) The program/industry being established as a result of the Project greatly increases the flexibility of the MOAC to shift crop production in accord with changes in climatic and economic (internal and world market) conditions through the introduction of new varieties and crops.

Within the elapsed time of the Seed Development Project, Thailand has made more progress in establishing a seed program/industry than any of the developing countries we are familiar with, many of which were assisted by a much higher level of funding and more concentrated technical assistance. The RTG and USAID can and should be pleased with what has been accomplished. Given even the same rate of progress in the next 2-3 years as in the past 2-3 years, Thailand will have the outstanding seed program/industry in the region, save perhaps for India where a program was initiated in the mid-1950's. FAO and others are already looking at Thailand as a base for regional training and workshops in seed program/industry development.

The outstanding progress made should not lead to complacency. Many problems--some serious--confront the developing seed program/industry in Thailand: problems such as waste disposal, management, and seed distribution and marketing. These problems, however, are solvable and must be dealt with expeditiously.

The most serious dilemma for Thailand's seed program/industry would be for the RTG, USAID and other donors to consider that the establishment of a seed program/industry is complete at the end of this Project. A seed industry does not develop in 6 or 10 years. It is always developing in accord with the changing situation in agriculture which the seed industry serves. High level RTG interest and support of the seed program/industry in Thailand must continue. And, continued interest in the program by international donors, including USAID, is equally important for long term success of the effort.

## II. Major Problems Confronting Progress of the Seed Development Project

1. The disposal of waste material and cull seed, particularly at Phitsanulok where processing has been underway for a number of years, is a critical problem. Waste material, cull seed, out of condition seed that must be sold as grain is not being disposed of. Rather it is occupying badly needed storage space, encouraging rat and insect infestation and causing a severe drain on the working capital account because the non-sale of waste seed (grain) has eliminated one source of replenishment for the Working Capital Account. This problem is becoming acute now that four other seed centers are operational.

2. The marketing and distribution of processed seed has not been a major problem to date since the level of seed production has not "strained" the rather ad hoc distribution system. This has led to some complacency that could be disastrous now that five processing plants are operating. Seed must be promoted and marketed through a planned system of distribution. The MOF was expected to play the lead role in this effort but has not. Alternative arrangements must be made immediately.

3. The price of seed is an issue that requires immediate attention. Costs of production are exceeding returns from seed sales causing a severe drain on the working capital account. The working capital account cannot be maintained long at present prices. In addition, the emerging private sector cannot compete with the highly subsidized DOAE seed prices. Low DOAE seed prices will discourage private sector expansion. It has been shown that farmers will pay premium prices for quality seed.

4. Rapid expansion of the seed program now that some degree of success is being achieved may be tempting. The Seed Division could be "pushed" into producing 1,500 to 2,000 tons of processed seed annually at each seed center. This would be a mistake. A one to two year period will be necessary for the Seed Division staff to gain experience and knowledge in the management and technical aspects of seed production, processing, and distribution operations. Rapid expansion of production at this point would be at the expense of seed quality and this, in the long run, would be a great disservice to the seed industry. Farmer confidence in improved seed must be developed and it cannot be done with low quality seed. Rather than rapid expansion in the public sector, private sector expansion should be promoted.

### III. Project Design Changes

#### 1. The Role of the Marketing Organization for Farmers (MOF)

Original project design envisioned a major MOF role in the Seed Development Project. This has not and, it now appears, will not come to pass. The Department of Agricultural Extension (DOAE) Seed Division will be the primary agency involved in the development of a seed program/industry in Thailand. Components of the project including multiplication of foundation seed through contract growers, management of the Working Capital Account, processing of multiplied seed, and marketing and distribution of seed will be responsibilities of the DOAE through the duration of the project and we expect thereafter. The Department of Agriculture (DA) will be responsible for production of foundation seed and inoculum. The MOF will continue to participate in the project but only as one of the primary agencies involved in the seed distribution system.

#### 2. Seed Production Targets

Based on experience to date and projected demand for seed the production targets for processed seed for Year VI will be revised as follows:

Rice	from 3,000 to 2,050 MT
Corn	from 1,600 to 1,300 MT
Soybean	from 2,200 to 450 MT
Peanut	from 1,200 to 525 MT
Mungbean	from 450 to 150 MT
Sorghum	from <u>200</u> to <u>75</u> MT
Totals	from 8,650 to 4,550 MT

Other donor (Japanese and EEC) funded Seed Centers and the private sector will more than make up the target "shortfall" caused by this revision.

#### 3. Increased Emphasis on Seed Promotion/Marketing

As previously noted there is a potential major problem with distribution of seed produced now that five plants are operating. To deal with this a Seed Promotion/Marketing Section should be established at each Seed Center. This section, probably one or two seed technologists at the start, would promote the use of good seed through extensive field activities in Provinces adjacent to the Center by working closely with and training Amphoe and Tambon Agents. Promotional activities could include the use of radio, TV, newspaper, leaflets, field days, farmer meetings, etc. The Seed Promotion/Marketing Section of each Seed Center could work with the field extension staff

to plan seed needs one year in advance so the Center Chief could schedule his production in an orderly manner.

A similar section should be established at the DOAE Seed Division headquarters to deal continuously with other agencies such as the MOF, ARD, Social Welfare Department, Crop Promotion Division, Cooperative Federation, etc. to establish and project their seed requirements in time to permit proper planning of Seed Division production. The DOAE Seed Division's Promotion/Marketing Section would also coordinate and support the Seed Promotion/Marketing efforts of each Seed Center.

4. Increased Emphasis on Seed Program/Industry Management

Emphasis to date has correctly been placed on establishing an institutional arrangement for management of a seed program/industry, e.g., contracting for technical assistance and equipment, getting approval for and recruiting staff, construction of facilities, etc. These activities will continue but at lesser intensity. Now that the "system" is, to a large extent, in place it must be managed to function effectively. DOAE management, training plans and technical assistance must focus on development of an effective management system for the seed program.

5. Private Sector Emphasis

The private sector is beginning to participate in seed production and supply operations--the seed industry. This involvement should be encouraged and promoted by the RTG and particularly by the DOAE Seed Division.

6. Working Capital Account (WCA)

This fund will be controlled by the DOAE. Procedures developed for implementation of the WCA, e.g., accounting procedures, inventory control, seed sales, etc., must be developed to serve the needs of the Seed Division and, more importantly, the various Seed Centers rather than to simply meet the requirements of the AID Loan. The WCA should be developed and established as a permanent fiscal mechanism to serve the needs of the DOAE Seed Division.

#### IV. List of Recommendations

The following recommendations are made to the Royal Thai Government and the USAID to assure progress of the Seed Development Project and the seed program industry in Thailand.

##### A. General Recommendations

1. That all waste material, cull seed, out-of-condition seed, etc. (much of which presently has no value) that have accumulated at the Seed Centers be disposed of immediately by establishing easily implemented procedures. Waste material, cull seed, etc. produced in the Centers should be disposed of on a regular basis, at least every two months. Existing waste material should be disposed of and disposal procedures operating by June 30, 1980.
2. That the Marketing Organization for Farmers (MOF) be disengaged from the Project but continue as a primary outlet for Project Seed. The DOAE Seed Division will have primary responsibility for Project implementation including ownership and operation of the Seed Centers.
3. That a Seed Promotion/Distribution Section be established at each Seed Center and in the Seed Division's central office.
4. That seed production costs be compared with seed prices and prices raised to cover costs, particularly in the case of corn and soybeans.
5. That Project seed production targets be revised downward to take into account delays in facility development, relative inexperience of personnel and management, the entry of the private sector and to permit scheduling of production based on market forces rather than project targets. Original targets will be met easily by the total Seed Division operations and the private sector.
6. That the Seed Division's management style be altered, now that the "building" phase of the Project is essentially complete, to deal with the "operating" phase into which the Project is now moving. A reorganization of the Seed Division may be appropriate.
7. That RTG (DOAE and DA) continue to encourage and assist private sector participation in the seed industry.

8. That the RTG and USAID document the economic benefits of the Project to contract seed producers and seed users to produce information and data needed in planning for the future development of the seed industry in Thailand.

**B. Seed Production Recommendations**

1. That for the duration of the Project, all seed production activities including seed procurement from contract seed producers be the responsibility of the DOAE rather than the MOF.

2. That the DOAE should as a matter of policy select seed growers as near to the Seed Centers as possible to reduce transport costs, facilitate supervision and inspection and assure that seed quality is maintained.

3. That a new and more reasonable set of quality standards for purchase of seed from contract growers be developed.

4. That the DOAE should no longer require contract farmers to rigorously "hand pick" the seed before it is purchased, and that all seed produced by contract growers that meets established standards be purchased by the DOAE.

5. That a trial system of installing "official purchasing" at the Seed Center truck scale be tried and that the present system which requires two "committees" be reviewed and simplified as possible.

6. That the DOAE buy high quality foundation in an "unclean" state from the DA for processing in DOAE plants prior to distribution to contract growers so as to relieve DA of the tedious task of hand cleaning seed and maximize use of DOAE's seed facilities.

7. That the DOAE produce an extra generation of peanut and soybean seed to reduce the requirement on DA for foundation seed of these low multiplication ration seed kinds.

8. That the production of seed be done through contract farmer growers as is presently being done and not through the establishment of government operated seed farms.

9. That in addition to the four established seed centers, two sub-centers, one at Chiang Mai and one at Kalasin, be established.

**C. Implementation Recommendations**

1. That a full-fledged seed certification program not be implemented at this time but rather emphasis given to establishment of a basic seed control system that would protect both the farmer and the legitimate private sector seed companies.
2. That implementation of the new accounting/management procedures for the DOAE as designed by SGV Na Thalang Company be implemented as rapidly as possible and extended to include all DOAE Seed Division activities.
3. That the DOAE continue its programs to make quality seed available to the smaller farmers.
4. That in-country training programs on management, quality control and seed marketing/production be implemented in CY 80 and CY 81, the latter with assistance from Mississippi State University AID technical assistance cooperative agreement.
5. That a study tour (two weeks) of four to five Seed Division, high-level officials and the Senior Seed Industry Consultants to DOAE be made to Indonesia to observe the operations of Indonesia's National Seed Corporation, particularly its network of private dealers and packaging of seed in small containers. The remainder of the third country training should be cancelled permitting use of funds for more in-country training or other suitable training programs.
6. That implementation of the participant training program be continued until it is completed.
7. That the project consultant program be revised to provide for a 2nd inoculant consultation and a seed marketing/promotion consultation with the other consultations programmed as needed for handling under the Mississippi State University-AID/DSB centrally funded cooperative agreement.
8. That Dr. Billy R. Gregg, MSU Senior Seed Specialist, be extended through December 1981 and that Mr. George Dougherty, Seed Processing Specialist, be extended until June 1981.
9. That the SGV Na Thalang management/accounting contract continue at least through December 1980 to assist the DOAE to firmly establish the newly designed management and accounting system.
10. That funds presently committed by USAID for the Seed Development Project be expended as planned including that

earmarked for the Working Capital Account and that following review of the Working Capital Account in late CY 1980 a decision be made regarding the need for additional funding beyond the present loan.

11. That the RTG increase staffing of the DOAE Seed Division particularly at the Lampang and Chai Nat Seed Centers.

12. That the Seed Executive Committee consider establishment of a small operational sub-committee to assist with day-to-day project implementation problems--this in addition to the existing Seed Implementation Committee.

13. That a system be established for periodic involvement of USAID top management in review sessions with the Director General of DOAE and the Director of the Seed Division.

14. That the terminal disbursement date for the project be extended to December 1982 to allow for installation and initial operation of all equipment, particularly that for the inoculation component.

15. That USAID maintain an interest in seed program/industry development in Thailand even after termination of the project and continue to support development through (1) provision of additional training opportunities for Thai seed workers as funds are available, (2) support of DOAE and DA requests for technical assistance and initiating actions needed to obtain technical assistance under relevant centrally funded AID contracts and cooperative agreements, (3) assistance given to the seed program/industry in the event of the surfacing of serious problems or impediments to progress.

#### D. Inoculum Recommendations

1. That the inoculum production targets be reduced to coincide with projected seed production and farmers demand.

2. That procurement of the inoculum production equipment be expedited.

3. That a close relationship be established between the DA Soil Microbiology Division and the AID centrally funded NIFTAL program.

## V. Review/Redesign Discussion of Project Components

This review/redesign effort after four years of implementation of the Seed Development Project involved an assessment of (1) the status of each of the major project components, (2) problems raised during previous evaluations and audits, and (3) thoughts and ideas expressed by RTG officials, RTG contractors, members of the private sector, and USAID officials. A discussion of the Review/Redesign Team's findings follows:

### A. Foundation Seed Program

The Project Paper (PP) properly envisaged that the Department of Agriculture (DA) would produce the breeder and foundation seed required for production of seed by the Department of Agricultural Extension (DOAE). The DA has had no difficulty producing adequate quantities of breeder and foundation seed of rice, maize (corn) and sorghum because of considerable previous experience, the relatively small quantities of seed needed, and the relative ease of producing rice, corn and sorghum seed. However, considerable difficulties have been experienced with foundation seed of soybean, peanut and mungbean. Soybean and peanut, especially, have a low multiplication ratio, e.g., 1:10 for peanut and about 1:20 for soybean vs. 1:50 for corn and 1:75 or greater for rice. Soybean, peanut and mungbean seed are also more difficult to produce in terms of quality, and the DA division responsible has less experience and poorer facilities than in the case of rice, sorghum and corn.

In order to reduce the burden on the DA of production of the rather large quantities of foundation seed of peanut and soybean, and the smaller quantity of foundation seed of mungbean, which is difficult to produce, project operations should be revised as follows:

(1) An extra generation of "multiplied" seed should be produced by the DOAE Seed Division equivalent to the 2nd generation step in a three generation multiplication scheme, i.e., "registered" seed. This would greatly reduce the requirement for foundation seed and ensure an adequate quantity of good quality seed for the final step in DOAE seed multiplication. This additional multiplication could be programmed by DOAE in its regular contract multiplication scheme utilizing the most experienced contract farmers. DOAE has already had to use an extra step in multiplication as an expedient in seasons when sufficient foundation seed were not available. It should be formalized into a recognized and routine operational procedure but should not excuse the DA from its responsibility of maximum foundation seed production.

(2) DOAE should make arrangements with DA for the purchase of "unclean" but otherwise high quality foundation seed. The seed could then be cleaned at the appropriate DOAE Seed Center, treated as necessary and brought up to as high a mechanical purity as desired. This procedure would increase utilization of the Seed Centers, ensure reasonable uniformity in the quality and appearance of foundation seed, and relieve DA of the tedious task of essentially hand cleaning substantial quantities of foundation seed. To assure maintenance of varietal purity during cleaning of the foundation seed by DOAE, a DA representative should inspect and approve the operational procedures used.

Other problems in the production and procurement of foundation seed can be easily resolved through better management, especially by:

(1) Timely decisions by DOAE on the quantities of foundation seed required of DA and regular discussions with the heads of the DA Sections involved.

(2) Storage of a reserve supply of foundation seed in the conditioned warehouses at the Seed Centers.

#### B. Seed Production Component

The general procedures described for seed production in the PP have been followed. The seed are produced by selected farmers under contract. The farmers are given instruction on production practices to be followed and are supervised by field inspectors. After production and harvesting is completed the seed are purchased if of acceptable quality, taken to the Seed Centers, processed and stored until distribution.

##### 1. The MOF Role

The major departure from the PP is that purchase of the seed is done by DOAE rather than MOF. The PP assigned the purchase function to MOF in an attempt to circumvent the bureaucratic purchasing procedures of DOAE. MOF has not functioned in this role. Thus, DOAE has properly accepted the purchase responsibility and evolved a reasonably efficient and effective system of purchase of the seed contracted with the farmer producers using Working Capital Account funds.

For the duration of the Project seed procurement from contract seed producers will be the responsibility of DOAE rather than of MOF.

## 2. Location of Contract Growers

The Project built on a small base of seed production established in 1972. As a result, some "old time" seed production areas have been retained even though they are at some distance from the nearest Seed Center. Additionally, the location of some Seed Centers was changed from the sites specified in the PP because of problems in obtaining suitable sites, i.e., Chiang Mai to Lampang, Khon Kaen to Korat. In the case of the relocation of the Northeast Center from Khon Kaen to Korat, the change placed the Center nearer to the corn production area but moved it far from the peanut production area. These circumstances have increased transportation distances and costs and have made it difficult to operate in the timely manner necessary for production of quality seed.

In view of escalating transport costs and in the interests of operational effectiveness and efficiency, the PP should be revised to emphasize the importance of concentrating seed production as near to the Seed Centers as possible.

In selecting seed producers, we suggest that the DOAE should, as a matter of policy, select seed growers as near to a Seed Center as possible to reduce transport costs, facilitate supervision and inspections, and ensure that seed quality is maintained.

## 3. Farm Level Processing

Delays in the construction and equipping of the Seed Centers caused the Seed Division to resort to a rather rigorous program of seed selection and sorting by the contract producers. Contract farmers are required to "hand pick" the seed before it is purchased. This was a good expedient when seed cleaning and sorting equipment was not available but can no longer be justified now that all Seed Centers are operational. This does not mean that seed of unacceptable quality should be purchased. Rather, it should be recognized that materials that can be cleaned out of seed by the machines available at the Seed Centers are best removed by the equipment rather than the farmers.

## 4. Seed Purchase Quality Standards

Revision in quality standards for purchase of seed from contract growers is needed. The availability of portable moisture testers (on order), hand grading screens, and examples of several "grades" of seed in bottles for reference (and observation by the farmers) provide an ample base for

establishing a sliding scale premium for the seed purchased based on quality. All seed produced by the farmer that meet these revised standards should be purchased.

#### 5. Purchasing Multiplied Seed

Although vastly improved, seed purchasing procedures and payment procedures are still somewhat inefficient. In addition, the physical transport of the seed to the Seed Centers is sometimes difficult to arrange in a timely manner. The installation of truck scales at the Seed Centers provides an opportunity for some experimentation with purchasing procedures.

For example, the DOAE should plan a trial system of installing the "official purchasing" at the Seed Center truck scale, and transport of the seed by the farmers to the Seed Center. The field inspector could assist the group of farmers in locating and hiring a commercial trucker. The transport cost could be added to the purchase price of the seed.

Acceptance of the seed for transport to the Seed Center for purchase would still have to be made in the production area. All seed approved for transport to the Seed Center would have to be purchased.

Two "committees" are presently involved in the purchase of every lot of multiplied seed--one to approve the purchase and one to accept the seed. The arrangement and scheduling of these committees places an onerous task on the Seed Center Chiefs, particularly since each Center is dealing with close to 1,000 contract growers. It seems that at least one committee could be eliminated and possibly both.

#### C. Seed Processing Component

##### 1. Location of Processing Facilities

Changes were made in the location of the Seed Centers from sites designated in the PP because of difficulties in obtaining sites. In two cases, this greatly increased the distance from the Seed Center to important production areas. In the case of the change in location from Chiang Mai to Lampang, DOAE has minimized the impact by establishing a sub-center or sub-station. A sub-center under the management of the Lampang Seed Center has been established at Chiang Mai. The sub-center consists of a dryer, small office and storehouse. While the seed still have to be transported to Lampang for processing,

receiving, storage and drying can be accomplished in a timely fashion. Trucks that pick up the seed at the Chiang Mai sub-center for transport to Lampang for processing can also deliver cleaned, packaged seed to Chiang Mai (loads both directions) for storage and distribution out of the sub-center to prevent "dead-hauling."

The change in site from Khon Kaen to Korat improved the location for corn and sorghum, but far removed the Seed Center from the best peanut seed producing area east of Khon Kaen going into the Kalasin area. The "bulkiness" of peanuts adds to the transport problem. To overcome this problem the Project should provide for the establishment of a sub-center of the Korat Seed Center to be located near Kalasin.

The Team recommends that a sub-center of the Korat Seed Center be established near Kalasin for peanut seed production, purchasing, drying, processing and distribution. Specialized peanut seed equipment procured under DOAE-4 can be used to equip the sub-center, as well as "spare" drying units and other spare equipment on hand. The sub-center can be established in an underused Extension Center making use of existing buildings to the extent possible to minimize investment costs. Programmed additions to the Korat Seed Center will be eliminated in view of shifting of some of its workload to the sub-center, and the establishment of two private seed companies to the South.

## 2. Transfer of Processing Units from DOAE to MOF

The PP specified the transfer of all processing centers established under the Project except the renovation and additions to Phitsanulok to the MOF in the 6th year of the Project.

The MOF which had just been established when the original PP was drafted has not developed as expected. Indeed it has shown little interest in the Seed Project and has not functioned in any of the roles assigned save in a very casual way. MOF has not demonstrated the capability to handle marketing of the seed produced--as envisaged in the PP--or to operate other aspects of the seed program.

In view of the failure of MOF to develop and perform as envisioned in the PP its role should be revised and ownership and operational management of the Seed Centers retained by DOAE.

DOAE should retain ownership and operational control of the Seed Centers after termination of the Project and for as long thereafter as deemed within the interests of agricultural development in Thailand as determined by MOAC.

### 3. Time Phasing of Activities

The Project has not met the seed production goals projected in the PP (see Table 1). The reasons for this shortfall are numerous but the most important are: (a) the production projections in the PP were highly optimistic--although not impossible--considering the limited experience base on which the Project was constructed; (b) delays in establishment of the Seed Centers caused by a host of bureaucratic problems--far more than anticipated. To its credit DOAE did produce seed even in the absence of facilities. Understandably, the makeshift arrangements limited the effectiveness of the effort, but experience was gained that is proving to be valuable now that the four Seed Centers are operational.

The optimistic production targets in the PP were important in providing goals in the early stages of the Project. Now, however, they act as a substantial impediment to sound, realistic and fiscally responsible planning. The PP targets are being used to plan production rather than marketing intelligence and experience. In an attempt to catch-up, production goals are being established that strain the capabilities of the newly operational Seed Centers to manage effectively and efficiently. The results are a possible waste of money and time and substantial risks of damage to the reputation of the seed program.

Seed production in 1980 will reach about 3,000 MT, the first operational year of all four Seed Centers, and with an ad hoc marketing program. This would be a substantial accomplishment judged by any of the experiences in seed program development in the LDCs. The danger is, of course, that the 3,000 MT of seed could swamp the marketing capability with a substantial loss of working capital in unsold seed. Too rapid escalation of production in the next few years to catch up with PP projected outputs could lead to mistakes in quality control that would be seriously damaging to the seed program.

In view of the essentially two year delay in establishment of the facilities, the establishment of a fifth Seed Center with Japanese assistance, the establishment of two private sector ventures, with two other private ventures in the construction phase, and the need to allow an interplay of supply and demand forces, the goals or targets of the Project need to be revised downward through 1982.

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Table 1

**Seed Production Targets - Actual Production - Revised Targets**

Crops	FY 1976		FY 1977		FY 1978		FY 1979		FY 1980		FY 1981		FY 1982	
	(1) Projected Production	(2) Actual Production	(1) Projected Production	(2) Actual Production	(1) Projected Production	(2) Actual Production	(1) Projected Production	(3) Estimated Production	(1) Projected Production	(4) Revised Estimate	(1) Projected Production	(4) Revised Estimate	(1) Projected Production	(4) Revised Estimate
Soybean	200	169	600	198	950	261	1,500	285	1,800	300	2,200	400	2,200	450
Corn			200	224	500	452	800	800	1,200	850	1,500	1,050	1,600	1,300
Rice				351	300		1,100	1,297	1,500	1,400	2,300	1,650	3,000	2,050
Peanut				99	200	223	400	400	600	500	900	500	1,200	525
Mungbean				17	25	22	75	40	150	125	250	150	450	150
Sorghum				26	50	29	100	75	150	50	200	50	200	75
<b>Total</b>	<b>200</b>	<b>173</b>	<b>800</b>	<b>915</b>	<b>2,025</b>	<b>1,605</b>	<b>3,975</b>	<b>2,897</b>	<b>5,400</b>	<b>3,225</b>	<b>7,350</b>	<b>3,800</b>	<b>8,650</b>	<b>5,550</b>

(1) Original PP projections.

(2) Actual production for each fiscal year (October 1 through September 30) which coincides with Thailand's two seasons, the dry season (October 1 through March 31) and the wet season (April 1 through September 30).

(3) Estimated production for FY 1979

(4) Revised production target based on project experience.

The Team believes the Project has reached a stage of development where it is desirable to reduce projected outputs to reflect the two year delay in establishing facilities, the installment of a fifth Seed Center (Japanese assistance) in the Seed Division program, and the establishment of the first two private sector seed firms, and to allow supply and demand forces to determine production schedules. Accordingly, the production goals for the 1980 through 1982 are decreased as per Table 2.

#### D. Seed Marketing/Distribution Component

##### 1. MOF Involvement

The marketing function was assigned to MOF in the PP. MOF has not accepted this responsibility and has made little effort to develop a capability for handling the marketing of seed in Thailand. Although MOF is credited with about 25% of the seed marketing, its role has been as a "broker." It is given orders for seed, in turn gives these orders to the DOAE, and the DOAE provides the seed. It has assumed none of the real responsibilities and risks involved and, of course, has not profited from its very limited activities.

More recently, MOF has stationed an agent at one of the Seed Centers. It appears that the agent serves only as a middleman. A farmer comes to the Center, goes to the MOF agent and pays cash for his seed, takes his receipt to DOAE staff who provide him with the seed. This MOF role is one in which the Seed Centers have been and still are active. No marketing is being done by the MOF agent.

We see no need for the MOF to duplicate what the DOAE Seed Centers have done and continue to do well-- sell seed direct to farmers at the Seed Centers.

##### 2. Outlets for Project Seed

Although MOF has not fulfilled its role in marketing, the Project as a whole has done a reasonably good job of distributing and marketing of the seed. Table 3 indicates the sale of seed through FY 1979. Government agencies and projects have been a major outlet for the seed as anticipated. These agencies and projects are concerned with a variety of aid activities at the village level ranging from emergency seed supply in the wake of natural disasters such as floods, droughts, etc., to those involved in security areas. The seed program has served and must continue to serve as a mechanism for supply in rehabilitation efforts and other efforts within the vital interests of the RTG.

Table 2

Seed Production Targets  
Original vs Revised by Fiscal Year

Seed Center Crop	* FY 1980		FY 1981		FY 1982	
	Original PP	Revised PP	Original PP	Revised PP	Original PP	Revised PP
<b>Phitsanulok</b>						
Corn	500	350	500	400	500	450
Rice	400	600	500	700	600	750
Mungbean	100	50	150	75	225	75
Soybean	1,000	-0-	1,000	-0-	1,000	-0-
Sub-Total	2,000	1,000	2,150	1,175	2,325	1,275
<b>Korat</b>						
Corn	300	250	400	300	500	350
Rice	400	250	500	350	600	400
Peanut	400	300	600	300	700	300
Sorghum	150	25	200	25	200	50
Sub-Total	1,250	825	1,700	975	2,000	1,100
<b>Lampang</b>						
Rice	200	200	300	200	300	350
Soybean	800	300	1,200	400	1,200	450
Peanut	200	200	300	200	500	225
Sub-Total	1,200	700	1,800	800	2,000	1,025
<b>Chai Nat</b>						
Corn	400	250	600	350	600	500
Rice	500	350	1,000	400	1,500	550
Mungbean	50	75	100	75	225	75
Sorghum	-0-	25	-0-	25	-0-	25
Sub-Total	950	700	1,700	850	2,325	1,150
<b>Grand Total</b>	<b>5,400</b>	<b>3,225</b>	<b>7,350</b>	<b>3,800</b>	<b>8,650</b>	<b>4,550</b>

\*FY is October 1, 1979 through September 30, 1980 for FY 1980 and the same period for subsequent FYs.

Table 3

Distribution of Project Seed  
FY 1976 through FY 1979 (3½ Years)  
(KG.)

Crop	Direct Sales to Farmers	Sales to MOF	Sales to DOAE Crop Promotion Div.	Total
Rice	801,568	410,080	250,779	1,462,427
Corn	515,394	367,919	174,546	1,057,859
Sorghum	52,076	18,970	29,700	100,746
Soybean	205,377	68,039	178,048	451,464
Peanut	208,985		227,594	436,579
Mungbean	10,750		29,426	40,176
<b>Total</b>	<b>1,794,150</b>	<b>865,008</b>	<b>890,093</b>	<b>3,549,251</b>

Unexpectedly, direct sales at the Seed Centers (especially Phitsanulok which was the only operational Seed Center until recently) have become a major outlet for the seed produced. It is heartening to see farmers outside the front entrance of the Phitsanulok Seed Center with several bags of seed waiting for a bus back to their homes in a town or village some distance from the Seed Center. About half of the seed marketed in 1979 by the Phitsanulok Seed Center (300 MT) was sold at the Center to farmers in one to five bag lots. In a recent instance a group of six farmers traveled from Phitsanulok to Chai Nat (about six to seven hours) in a locally made truck to obtain corn seed because Phitsanulok had sold out of corn seed. The increasing direct counter sales at the Seed Centers clearly indicate that many Thai farmers are convinced of the value of good seed, and have confidence in the seed produced by the Project.

### 3. Marketing and Distribution in the Future

Despite reasonably good success in marketing thus far, marketing is a critical issue in the seed program. As the volume of seed produced increases, readily available outlets will become satisfied and surpluses will develop. A sustained aggressive marketing/distribution program must be developed. If DOAE continues to have the major responsibility for marketing-- as is the present case--it will have to establish a Seed Promotion/Marketing Section within the Seed Division and install a similar section at each Seed Center, and evolve an imaginative, aggressive and comprehensive seed promotion/marketing program including at least a trial of private merchant dealerships in selected villages. In view of the lack of an aggressive marketing system and the lack of an organization within the DOAE Seed Division for marketing, the Team recommends the following:

Considering the crucial role of marketing/distribution in seed production and supply operations and the failure of MOF to organize a marketing system as originally envisaged, DOAE must establish a Seed Promotion/Marketing Section in its Seed Division and develop an aggressive, comprehensive program for promoting and distributing the seed produced by the Seed Division.

#### E. Private Sector Involvement

##### 1. As Envisioned in the PP

In the PP it is pointed out that the RTG made a deliberate choice not to include private merchants as distributors

of project seed because of fear that they would reap unreasonable profits from an investment in the public sector.

The economic analysis in the PP indicated rather low rate of return (IRR) on investment for the Seed Project as a seed business (excluding associated and social benefits) given the mix of seed kinds in the Project. At the time the PP was prepared there was no interest in the private sector in investing in seed production and processing. Private merchants were interested, however, in selling seed if they could acquire seed from a dependable source.

## 2. A Changing Situation

The situation in Thailand has changed. Two private seed companies have been established, i.e., investments in seed facilities have been made and contract production with farmers established; two other companies are constructing seed facilities. Other companies--some with possible United States, Australian, etc. partners--are looking into the feasibility of a seed operation in Thailand. There is no doubt that the investments made by the private sector and potential investments were largely influenced by the Seed Project. The Seed Project provided an example of a seed operation, demonstrated that farmers would buy seed and provided technical assistance in terms of advice on facilities and training of workers. Indeed, one of the private seed companies essentially duplicated the core facilities at the Project Seed Centers including purchase of United States made seed equipment.

As might have been predicted, the two established private companies and other potential seed companies have been highly selective in terms of the kinds of seed being produced and market orientation. Both companies are concentrating on corn with a little emphasis on sorghum. One company is a subsidiary of a large feed company with a chain of operations in Thailand. Presumably, the Seed Unit fits into an overall plan for vertical integration, i.e., seed to grain, grain to feed, feed to chickens, chickens to market. This will be beneficial to Thai agricultural development because a large number of seed producer farmers and grain producer farmers will be using better seed and receiving advice on better production practices. The other seed company is associated with corn export operations. Again, the investment undoubtedly reflects a desire on the part of corn export interests to increase production among the farmers so that the supply of corn for export will increase.

The RTG, specially DOAE, has encouraged and assisted the private seed companies. Presently, at least, they recognize that a really effective seed industry cannot be established without private sector participation. They also recognize that the private sector will be highly selective in terms of kinds of seed handled, and that the Seed Centers will be needed for an indefinite period to produce and supply low-profit seed kinds such as peanut and rice seed, "new" seed kinds such as seed of castor bean, and sesame, and seed kinds with good profit potential but with risks in maintaining seed quality that might be unacceptable in a private venture, i.e., soybean and mungbean.

Both private seed companies have hired plant breeders and one is connected with a large international plant breeding firm. There is little doubt that both firms have plans to introduce hybrid corn and sorghum to Thailand. This could be highly successful and have a tremendous impact on Thai exports of corn and sorghum.

### 3. Future Private Sector Investment

The RTG (and DOAE and DA) should continue to support the development of a private sector seed industry. Support is needed in terms of: (a) technical assistance; (b) training opportunities; (c) upward price revisions especially for corn and sorghum seed so as to avoid large price differentials between DOAE and private company seed prices; and (d) implementation of a basic seed control system that will both protect consumers of seed and assist the private companies in their quality control activities.

Although the RTG (DOAE) has encouraged the establishment of private seed ventures, there is still substantial resistance to use of private merchants in the marketing and distribution of DOAE produced seed, especially at the small town and village level. The fear is that the private merchants will take advantage of periodic seed shortages and charge farmers exorbitant prices for seed.

DOAE and other RTG agencies need to re-examine their position with respect to use of private merchants to handle and sell DOAE produced seed. At the very least a trial should be made in one or two areas to use selected private merchants as selling agents for DOAE seed. The merchants could be organized as commission agents receiving a set percent for handling and selling DOAE seed, or as "franchise" dealers for DOAE seed with sales at an agreed to reasonable price.

Continuation of sales at the Seed Center counters, and through the extension service (not in areas with franchise dealers or commission agents but in nearby areas) would offer farmers alternatives that would bring discipline in price structures for the different kinds of seed.

#### F. Organization and Management

At the present stage management of the seed program is also a most crucial issue. And, it will remain the key to achievements in the DOAE Seed Division operations, and in the private sector operations for as long as operations continue.

##### 1. The Changing Management Requirements

The concerns of management in gathering and using the resources required for establishing the physical base of a seed program or industry, i.e., facilities and equipment, is quite different from the concerns of management in running a seed production and supply operation. Up to this time, management has concentrated on the establishment of facilities, linkages to farmers for contract seed production, training of personnel, and necessary inter-actions with a host of RTG Departments, Bureaus, etc. Although the bureaucracy has slowed the implementation scheduled by 1.5 to 2 years, management has been outstanding. The existing Seed Center (Phitsanulok) was improved, four new Centers have been established and are now operational, contract seed producers are gaining experience, seed are being distributed and marketed. A truly outstanding physical base for seed production and supply operations has been established. It could not have been done--given the bureaucracy--without superb, dedicated management.

The situation now requires different management emphasis. The emphasis needs to be on: (a) detailed, realistic planning of production, processing, quality control and marketing; (b) increasing the operational effectiveness and efficiency of the Seed Centers; (c) expediting the decision making process; (d) development of responsible personnel with a clear grasp of their responsibilities; (e) improvements in organization to enable management to better accomplish its objectives; and (f) seed promotion and marketing.

Some re-organization is needed to switch the emphasis and direction of management from the "building" phase to the "operating" phase, and take into account the rather large and widespread organization that has to be managed. The Director, Seed Division, DOAE, needs relief from a host of routine decisions and problems to allow him time for forward planning, coordination with other agencies, and of the Seed Division units, and improvements in the overall structure of the program.

## 2. Suggested Organizational Changes

Specifically, the following organizational changes in the Seed Division and Seed Centers are suggested.

a. The Seed Division has properly organized the Seed Centers along functional lines: Chief of Seed Center; Admin-Management; production; processing/warehousing; and quality control sections. The deficiency in organization is lack of a section (person) responsible for "extension" and promotion of the use of good seed and marketing. Each Center should be staffed with an officer(s) responsible for working with farmers and farmer groups to promote the use of good seed, other extension units involved in assistance to farmers, credit agencies, private merchants, etc., so as to expedite the sales/marketing of the seed produced by the Center. There is need also for clarification of the responsibilities of each section in the Seed Center so that all operations are carried out in an efficient manner.

b. Seed Division Headquarters (Bangkok) is organized differently from the Seed Centers; Director, Seed Division; Admin-Management; rice; field crops; oil seeds sections (or officers). The rice officer, for example, is responsible for over-looking and assisting with technical problems in production, processing, quality control of rice, development of markets for rice seed, maintenance of overall inventory of rice seed, and marketing. This sort of organization results in the Seed Division Director having to deal with three to four persons to determine the overall status of seed production, processing, sales or inventory at the Seed Centers. In similar fashion, the processing officer at a Seed Center confronted with a general (i.e., non-crop specific) problem has to deal with three to four officers in Bangkok, none of whom have as much experience in processing as he has, or he must deal directly with the Director of the Seed Division.

The crop-wise organization in Seed Division Headquarters parallels the organization in DA and in the Crop Promotion Division of DOAE, rather than its own Seed Centers. It does not permit proper coordination of the functional components of a seed program/industry, or the development of technical/operational expertise in Seed Division Headquarters needed to oversee and backstop the Seed Centers. Seed Division Headquarters should be reorganized to include at least the following:

Director, Seed Division

Sections:

- (1) Admin-Management, with one officer designated specifically as logistics officer and responsible for the procurement and timely distribution of supplies to the Seed Centers.
- (2) Production, an officer responsible for coordination of production/multiplication of all kinds of seed among the Centers, development of better and more uniform procedures, and assisting the Seed Centers with technical problems in seed production.
- (3) Processing/Warehousing, an officer responsible for coordinating processing-warehousing operations at the Centers, developing better procedures, and technical backstopping of the Centers.
- (4) Quality Control, an officer responsible for coordinating quality control activities and technical backstopping of the Seed Centers; development and installation of better procedures and training.
- (5) Seed Promotion/Marketing Officer, responsible for coordination of marketing activities, market promotion, liaison with MOF and other RTG agencies involved in supplying seed, and training in marketing activities.

G. Pricing of Seed

The prices presently charged for seed produced by DOAE do not constrain marketing. Since this is the situation and considering the losses being sustained by DOAE, due in part to limited production and high start up costs, the price structure should be revised upward. This is especially important in the case of corn and sorghum seed with which the private sector is now involved. The emerging private sector could be seriously damaged if there is a considerable differential between the prices it must charge to make a profit and the DOAE price which is now subsidized.

Much effort on the part of Project staff has gone into determining seed production costs. These costs should be considered in determining seed pricing structure. It appears, for example, that the corn price should approach B10 per kg. rather than the present B5 per kg.

Unless the RTG seed price structure is revised upward the Working Capital Account will not be replenished but will quickly be drawn down to the zero level.

#### H. Seed Certification

It is the Team's view that the development of a full fledged seed certification program is not appropriate at this time. The DOAE is presently producing "certified" seed except that it is not being certified by an outside agency. To attempt to do this at this stage of the Project would only add a complex and difficult project element that would not appreciably improve the quality of the seed presently produced.

There is, however, the need for a basic seed control system that will both protect the farmer from merchants selling grain with low germination and purity as seed and at the same time assist legitimate private sector seed companies in their quality control activities. In addition, it will protect them from merchants selling so-called "seed" at prices that cannot possibly be met by legitimate seed companies.

Short term technical assistance should be arranged to assist the RTG with development of a basic seed control system-- probably within the DA.

#### I. Working Capital Account

##### 1. Use of the Working Capital Account

The Working Capital Account was included in the Project to provide a continuous funding source that would give the flexibility, not provided in the regular RTG budgetary process, to operate a seed program. It was designed as a revolving fund to be drawn down as purchases, e.g., for foundation seed, for multiplied seed from contract growers, for bags, tags, other supplies, etc., were made. It was to be replenished by sales of foundation seed, of processed seed, of cull seed, waste, etc. It was a difficult system to introduce but appears to have been worth the effort. They began using the account in January 1978. Table 4 provides information on its use through September 1979.

Table 4

Working Capital Account

Receipts - Expenditures through September 1979

<u>Receipts</u>	<u>Periods</u>	
	<u>Jan.-Sept. '78</u>	<u>Oct.'78-Sept.'79</u>
Carried Forward	-0-	2,252,648
Foundation Seed Sales	208,648	840,082
Sales to Crop Promotion Division	421,415	4,108,345
Sales to MOF	1,041,800	1,733,637
Direct Sales to Farmers	567,099	1,376,870
Sales to Other RTG Agencies	163,826	2,657,841
USAID Loan Input	9,574,213	8,500,000
Unused Advances	-0-	2,198,371
<b>Total Receipts</b>	<b>₱11,977,001</b>	<b>₱23,667,794</b>
<u>Expenditures</u>		
Payments to Contract Growers	7,175,033	11,401,100
Cost of Production Supplies	816,900	1,008,130
Cost of Foundation Seed	1,731,420	2,835,615
Cost of Inoculant	-0-	60,750
Accounts Payable	-0-	2,298,215
<b>Total Expenditures</b>	<b>₱ 9,724,353</b>	<b>₱17,603,810</b>
<b>Balance at End of Period</b>	<b>₱ 2,252,648</b>	<b>₱ 6,063,984</b>

There are serious deficiencies in the present accounting procedures used for maintaining records of fund flows. This was to be expected in a new system such as this.

## 2. Establishing Accounting and Management Procedures

A contract, funded by the Project Training Grant, is in effect between the RTG and SGV Na Thalang and Co., Ltd. to develop a management accounting system for the DOAE Seed Division which would include the operation of the Working Capital Account. The system has been developed and is being implemented by the Seed Division and its Seed Centers. A one week training program at Phitsanulok introduced the system to DOAE personnel the week of February 12, 1980. English translations of the latest, much simplified manuals developed by SGV Na Thalang were not available. The earlier version, before simplification, is in English. Once fully operational, we would expect that by the end of 1980, all of the information needed to effectively manage a complex seed operation should be available.

SGV personnel should continue to assist the DOAE through December 1980 to be sure the system is properly implemented.

## 3. Dual and Triple Management/Accounting

Once the SGV system is operating effectively steps should be taken to adapt it to the entire Seed Division operation. Presently there is an account for USAID funds, one for Japanese funds, and there soon will be one for EEC funds. This puts onerous requirements on a Division that should be using all its efforts to manage a "seed industry" rather than individual donor funds.

It now appears that the Working Capital Account, adapted to the RTG methodology, will be an integral and important part of the Seed Division's management tools. Only through dedicated and tireless efforts on the part of DOAE and USAID management could this have been accomplished. It obviously was not an easy task.

## J. Beneficiaries

A seed program represents a long-term investment in agriculture in any country. In the case of Thailand the initial investment was made by and in the public sector. The benefits to Thailand of the investment are already being reaped. They

will continue for as long as the Seed Centers produce, process and market seed. The beneficiaries have been and will continue to be: (a) the Thai farmers who produce the seed for DOAE and receive a premium over market price for their production, plus the benefits of better yields and instruction/supervision in better farming practices; (b) the Thai farmer who buys seed from the seed program, gets advice at the time of sale on the best variety to use, plants the seed and gets better production; (c) the Thai farmer who buys or receives seed for demonstration and seed multiplication purposes from RTG agencies such as the DOAE Crop Promotion Division, Public Welfare Department, ARD, etc.; (d) the "mixed bag" of farmers supplied with seed after a flood or drought and, thus, able to produce a crop of some sort; and (e) Thai agriculture which must use good seed of the best varieties to increase production.

### 1. Contract Growers

When the Project was designed it was expected and in fact DOAE was encouraged to use larger more progressive farmers to produce the seed required under the project. This policy was encouraged to facilitate supervision, e.g., the larger the farmer the fewer that would have to be supervised, and ensure a better end product, e.g., the more progressive farmers would be more likely to adopt and implement the new production methods. In reality the DOAE is successfully using smaller farmers. In Lampang for example the average size holding of the contract growers is 7 rai (about 3 acres). Some 3,500 small farmers will be involved this year, FY 1980. Each will receive 10-20 percent more income than they would if they sold their crops for grain rather than seed.

### 2. Farmers Buying Direct from a Seed Center

Through FY 1979 over 50 percent (1,794 of 3,549 ton) of the seed processed was sold direct to farmers who came to a Seed Center, primarily Phitsanulok, and purchased it. The majority was in one to five bag lots, an indication that many small farmers are receiving the seed that is sold direct.

### 3. Other RTG Agency Activities

In 1979 the Crop Promotion Division of DOAE had some 9,000 acres of field demonstrations throughout the country. These demonstrations included corn, sorghum, mungbean, peanut and soybean. About half of these demonstrations were oriented directly at the small farmer and all used improved seed from the Project. It was impressed upon each farmer involved that production of the demonstrations should be sold or traded as seed rather than grain so as to get the maximum spread effect

on the improved varieties. Even if only 25 percent of the farmer demonstration plot production are used as seed, large amounts of improved seed are indirectly reaching large numbers of farmers.

ARD is purchasing about 100 tons of Project seed each year for use in the remote and more sensitive areas of the country. The type of farmer they are dealing with is the type envisioned during project design--the small poorer farmers.

The Social Welfare Department is also using project seed in their settlement areas made up primarily of poorer Thai farmers.

#### 4. Disaster Assistance

A large volume of seed, handled by the Crop Promotion Division of DOAE, is used for disaster relief. In 1979 alone some 5,700 tons of seed of crops included in the Project were distributed as part of the flood and drought relief program. A substantial portion of this was Project seed, or the progeny of Project seed.

In the areas adjacent to the Seed Centers farmers are becoming aware that quality seed is available and there is clear indication that the smaller farmer is getting his share.

#### K. Participant Training

Participant training as indicated in the PP Annex B-21 has lagged far behind the implementation schedule. RTG Civil Service regulations do not permit approval of staff until the Seed Centers are ready for operation. The DOAE Seed Division, therefore, could not select trainees. Nevertheless, three of the six participants for degree training are enrolled at Mississippi State University, and the remaining three are in final processes of admission.

Short term participant training has been limited to two participants in CY 1979, with an additional four participants scheduled for June-September 1980. The remaining three short term participants have not been selected.

The 3rd country training has not been implemented. In view of the progress in Thailand the probability for any in-depth learning experience in 3rd countries such as the Philippines is practically nil. The 3rd country training program should be revised.

In-country training has also lagged as a result of delays in staffing. Nevertheless, a good portion of the training objectives have been accomplished through in-service training using the Phitsanulok Seed Center as the training vehicle. Now that all Seed Centers are operational and at least partially staffed, the remainder of the in-country training can and should be accomplished in CY 1980 and the first half of CY 1981.

### Specific Suggestions for Revision

1. In-Country Training should include at least the following:

- a. Processing and Handling, CY 1980, 2 weeks. Assisted by MSU specialists in Thailand.
- b. Quality Control Workshop, CY 1980, 3 weeks. Assisted by MSU specialists available under the MSU/AID/DSB centrally funded contract.
- c. Marketing-Extension-Seed Promotion Workshop, CY 1980, 2 weeks. Assisted by consultant from technical assistance component.
- d. Seed Industry Management Workshop, CY 1981, 3 weeks. Assisted by MSU specialists available under the MSU/AID/DSB centrally funded contract.

2. 3rd Country Training should include at least the following:

A two week study tour of four to five Seed Division high level officers (i.e. Director, Seed Division and three Seed Center Chiefs) with Indonesia's National Seed Corporation to observe the network of private dealers, and packaging of seed in small bags (six kg.) to better fit needs of the average farmer. The MSU Senior Seed Specialist in Thailand should accompany the group to Indonesia.

3. Participant Training

Continue with programmed schedule. If possible, defer planned participation of one each from the Chai Nat and Lampang Seed Centers until summer 1981, so that operations at these Seed Centers can continue in an orderly manner. As presently planned, both the Chief and his Deputy will be in the United States at the same time.

L. Technical Assistance

The Senior Seed Specialist is scheduled to depart April, 1981. The Seed Processing Specialist was extended for two years, or until June, 1981. Both in the opinion of the Redesign Team are doing an outstanding job.

It would be desirable and the Team recommends that the Senior Seed Specialist be extended for an additional eight months to the end of December, 1981. This would allow him to help with implementation of a better marketing/distribution plan, organization and assist in much needed management improvements.

Only one consultant has been used, i.e., inoculant expert. It is recommended that of the remainder only the second inoculant consultation and the marketing seed promotion consultation be retained in the technical assistance component of the Project.

Other consultations are needed in Seed Quality Control and Seed Control (Seed Law/Certification in PP) and in Seed Industry Management but these can best be handled under the Mississippi State University--AID/DSB centrally funded technical assistance cooperative agreement. Services under this cooperative agreement are available on request through Asia Bureau in AID/W at no cost to Mission save for some local services and transportation.

Assistance from SGV Na Thalang should be continued at least through December 1980 to assure that the management accounting system is properly implemented.

M. Inoculum Component

The inoculum component of the Project is with the Bacteriology and Soil Microbiology Branch of the DA. They have at present eight staff working on the program; four M.S., three B.S., and shortly one Ph.D. now in training in the United States. The Bacteriology and Soil Microbiology Branch has been producing equal amounts of inoculum for soybeans, mungbeans and peanuts as follows (one ton is sufficient for 5,000 rai):

1978	-	12.5 tons
1979	-	6.2 tons

The inoculum is packaged in 200 gram packages (sufficient for one rai) and sold for B10 per package. The marketing of the inoculum has been a major problem. MOF has not been helpful as envisioned in the PP. DA is now setting up its own distribution system using some 34 research stations throughout Thailand.

The Team recommends that:

- (1) USAID expedite approval of the IFB for inoculum production equipment.
- (2) Technical assistance as planned be provided to assist with installation and initial operations of the equipment.
- (3) That USAID involvement after equipment installation be through the NIFTAL/AID/DSB centrally funded project.
- (4) That DA coordinate its marketing/distribution of inoculum with the DOAE Seed Division so as to use DOAE as an outlet for its inoculum.
- (5) That inoculum production targets be reduced to coincide with prior experience and market demand. There is no point in producing inoculum that will not be sold.

N. Project Financing

1. The USG (See Table 5)

USAID has committed \$3.924 million, of which \$299,000 is grant funds, for the Seed Development Project. Through February 1980 \$2,210,578 has been disbursed or contracted for leaving a balance of some \$1.7 million. The balance is needed and can be easily disbursed but not by the present terminal disbursement date (TDD), April 11, 1981. The problem lies with the procurement of the equipment for the inoculant program. The IFB is now (February 26, 1980) in USAID for review. Significant changes by USAID will require that it go back through the RTG system for more reviews and experience indicates this would take six months. This would put arrival of the equipment in late CY 1981 and inspection and final approval for payment well into CY 1982. Assuming the IFB follows, in general terms, the same procedures used for previous procurements under the Seed Development Project the IFB review should be expedited through USAID.

Some \$700,000 to \$800,000 remain available for the Working Capital Account of the Project. These funds should be released upon request from the RTG. Additional funds, beyond those available, may be required to make the account operational but a decision on additional USAID input should not be made until the new accounting/management procedures

**USAID Funding Status**

	Planned		Actual through February 1980		Future Plans	
	Foreign Ex.	Local Costs	FX	LC	FX	LC
<b>Fixed Assets</b>						
Buildings & Facilities	-0-	-0-		-0-		
Equipment	431.9	-0-	605,015		200,000	
Vehicles	-0-	-0-		-0-	(DOAE-4)	
<b>Working Capital Fund</b>		1,500		888,095		761,922
<b>Other</b>						
Extension Services	-0-	-0-				
Technical Assistance	454.5	-0-	(MSU) \$568,973		45,000	
			(Burton) 6,500		(Gregg ext.)	
Inoculant Program	216.0	-0-			500,000	
<u>1/</u> Training	*245.0	-0-	(Part. Trng.) \$53,409		146,500	
			(SGV) \$32,000		(SGV) 13,000	
<u>2/</u> Evaluation	* 75.0	-0-	6,586		60,000	
<b>Sub-Total</b>	1,422.4	1,500	\$1,322,483	\$888,095	964,500	761,922
25% Inflation	355.6	375.0				
10% Contingency	142.2	150.0				
<b>Grand Total</b>	\$1,920.1	\$2,025.0	\$2,210,578		\$1,726,422	

**\* Grant Funds**

1/ Training for Seed Development \$200,000 - (Grant No. AID 493-106-T)  
 SGV Na Thalang & Co., Ltd. Contract  
 \$32,000 - (PIO/T 493-275-3-60021)

2/ Evaluation for Seed Devel. \$67,000 - (PIO/T 493-275-3-70024 = \$15,000)  
 (PIO/T 493-275-3-70025 = \$52,000)

clearly indicate the actual status of the account. Additional USAID funding should be subject to:

- (1) An effective operating accounting/management system now being developed with SGV Na Thalang assistance.
- (2) An upward revision of the seed pricing structure.
- (3) An effective and operational system for disposal of waste and cull seed.

2. The RTG (See Table 6)

The RTG input to the Project was expected to be some \$4 million. The DOAE alone, through FY 1979, expended close to \$3 million and has nearly \$2.5 budgeted for FY 1980 and 1981. The Department of Agriculture has expended some \$850,000 for the inoculum program alone--not including those funds used for the foundation seed component. The RTG input will far exceed that projected--indicating their resolve to develop a seed program/industry in Thailand.

0. Project Implementation

1. By the RTG

The RTG has established a Seed Division in the DOAE to manage and promote seed development activities in Thailand. The task of implementing the Project falls under this Division. The Division presently has 236 approved positions with 224 people in place. 196 additional positions have been requested from the Civil Service Commission in 1980. Staffing has been adequate to date (see Table 7); however, there is critical need for additional qualified staff at the Chai Nat and Lampang Seed Centers.

The Director of the DOAE Seed Division should continue to play the lead role in implementation of the Project. The Seed Executive Committee and the Seed Implementation Committee are in place but have not been meeting as regularly as would be desirable to deal with Project implementation problems. The Seed Implementation Committee, with a membership of 17, is perhaps the appropriate vehicle to keep the RTG informed and is necessary for the Seed Project to interact with the numerous agencies involved. It is the view of the Redesign Team, however, that it is too large to deal effectively with day-to-day implementation problems. We, therefore, suggest

**RTG Seed Development Project Input - DOAE**

	<u>Salaries</u>	<u>Operating Exp/Supplies</u>	<u>Equip. Vehicles</u>	<u>Construction</u>	<u>Other</u>	<u>Total</u>
<b>FY 1976*</b>			(Breakdown not available)			<b>⌘ 7,716,500</b>
<b>FY 1977*</b>	<b>663,970</b>	<b>3,940,805</b>	<b>808,688</b>	<b>9,327,567</b>	<b>149,202</b>	<b>⌘ 14,890,232</b>
<b>FY 1978*</b>	<b>750,776</b>	<b>2,207,395</b>	<b>2,241,514</b>	<b>12,717,714</b>	<b>1,528,615</b>	<b>⌘ 19,446,014</b>
<b>FY 1979*</b>	<b>2,970,750</b>	<b>3,327,614</b>	<b>3,668,938</b>	<b>2,832,774</b>	<b>3,113,073</b>	<b>⌘ 15,913,149</b>
<b>FY 1980**</b>	<b>4,344,700</b>	<b>5,835,300</b>	<b>4,527,000</b>	<b>4,593,000</b>	<b>1,031,300</b>	<b>⌘ 20,331,300</b>
<b>FY 1981**</b>	<b>5,935,681</b>	<b>7,583,080</b>	<b>4,395,150</b>	<b>8,422,100</b>	<b>1,306,149</b>	<b>⌘ 27,642,160</b>
						<b>⌘105,939,455</b>
						<b>(\$5,296,973)</b>

**\*Actual Expenses**

**\*\*Amount Budgeted**

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**Table 7**

**Status of Headquarters and Center Staffing  
PP Plan (6th Year) vs Actual**

Employee Category	Headquarters		Phitsanulok Center		Korat Center		Lampang Center		Chai Nat Center		Totals	
	PP Plan 6th Year	Actual approved/filled	PP Plan 6th Year	Actual approved/filled	PP Plan 6th Year	Actual approved/filled	PP Plan 6th Year	Actual approved/filled	PP Plan 6th Year	Actual approved/filled	PP Plan 6th Year	Actual approved/filled
Regular Civil Service	18	18/13	14	27/24	11	27/25	11	12/12	11	12/11	65	96/85
Permanent Hire	4	10/10	5	30/30	5	27/27	5	20/20	5	17/17	24	104/104
Temporary Hire	0	12/11	5	6/6	5	2/2	5	9/9	5	7/7	20	36/35
<b>Totals</b>	<b>22</b>	<b>40/34</b>	<b>24</b>	<b>63/60</b>	<b>21</b>	<b>56/54</b>	<b>21</b>	<b>41/41</b>	<b>21</b>	<b>36/35</b>	<b>109</b>	<b>236/224</b>

**Note:** 196 additional positions have been requested from the Civil Service Commission in 1980 for the Headquarters, Lampong and Chai Nat Centers. In addition, staff are required for one Seed Center and two Sub-Centers not planned in the original PP

the Seed Executive Committee consider establishment of smaller group in addition to the existing group that would assist the Director of the Seed Division in solving day-to-day implementation problems as follows:

Director-General of DOAE  
Director-General or Deputy of DA  
Director of DOAE Seed Division  
BOB Representative  
MOAC Under-Secretary Office Representative  
One Seed Center Chief  
One Private Sector Representative

and, perhaps, One Farmer.

As the Project progresses the problems at the Seed Center level will increase simply because that is where most of the activity will be. Procedures must be established to assist the Seed Center Chiefs in a timely and helpful manner.

2. By USAID

Two USAID Project Officers, one Thai and one American, each have been spending about one-half of their time assisting with implementation of the Project. This one full-time person equivalent was necessary because of the many contracting, procurement, and other problems related to establishing a program totally new to the RTG and in some cases USAID. This level of USAID effort should continue over the next six months after which most of the "new" problems will have been dealt with. At that point we feel one-third time of each a Thai and American Project Officer would be sufficient.

We see also the need for a closer involvement of USAID top management in the program, e.g., review sessions with the Director-General and Director of the Seed Division and more frequent Seed Center visits.

We recommend that the Terminal Disbursement Date (TDD) be extended until December 1982 to allow for installation and approval of all equipment.

Although technical assistance will end in 1981 we recommend regular visits from MSU, funded by the MSU/AID/DSB cooperative agreement, be made perhaps every six months to review progress, problems, etc.